

Albatross Control System v1.4

Albatross Alba-Engine R1_4 interface Manual

PRELIMINARY

Rev.PA4



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Any feedback that may help EMMI Network SL improve the documentation and information methods is welcome.



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1 Contents

1.1 Purpose

The purpose of this document is to provide the user with the necessary instructions for the installation and usage of the NME A2000 Albatross Alba-Engine interface. The NME A2000 Albatross Alba- Engine is a device intended to monitor NME A2000 marine motors.

The following handbook deals with the Alba-Engine firmware version 1.20.

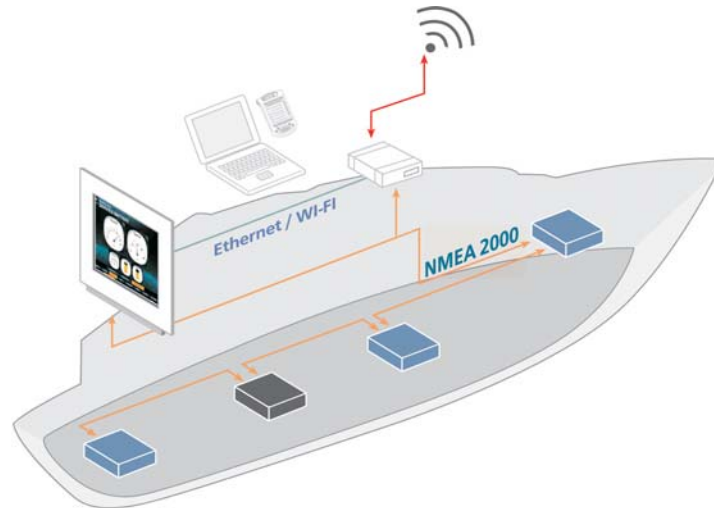
1.2 Review history

Review	Date	Comments/Changes
PA1	2006-11-28	First version
PA2	2006-12-22	Minor updates
PA3	2007-01-02	Connection diagram to VDO gauges updated
PA4	2007-01-22	Format review

Table 1 Revision History

2 Introduction

Thanks for purchasing the new Albatross digital control system component.



The following handbook contains important information regarding the installation, operation and maintenance of your new digital control system. In order to get the best results from the unit, please read this handbook thoroughly.

2.1 Specifications

The Albatross Alba-Engine interface has the following specifications:

- NMEA 2000 interface
- Adapts standard (10-180 ohm) European resistive sensors to the NMEA 2000 network.
- Adapts standard (30-240 ohm) American resistive sensors to the NMEA 2000 network.
- Adapts non-standard resistive sensors () to the NMEA 2000 network
- Adapts VDO technology- equipped sensors (0-5 V) to the NMEA 2000 network
- Can be calibrated both in resistive and voltage modes.
- Can work in parallel with already installed analogue gauges or connected directly to sensors (in motors without a control panel)
- Motor RPM measurement
- Alternator tension measuring
- Oil pressure measuring
- Boost pressure measuring
- Cooling agent temperature measuring
- Oil temperature measuring
- Cooling water pressure measuring



2.2 Quick installation

To install the Alba-Engine interface, you must complete the following steps. Please study each referenced individual section for in-depth information on each of them:

- 1 Unpacking the box.
- 2 Choose a location for the interface installation.
- 3 Connect the interface.
- 4 Interface configuration.
- 5 Sensor calibration depending on its commercial model.
- 6 Optional: Custom sensor calibration

3 Installation

3.1 Unpacking the unit

When you unpack the box containing your Albatross Alba-Engine interface, you should find the following elements:

- Alba-Engine interface
- Alba-Engine User Manual
- Bag with the mounting screws

If any of these elements is damaged or not present, please contact Emmi network

3.2 Choosing a location to mount the module

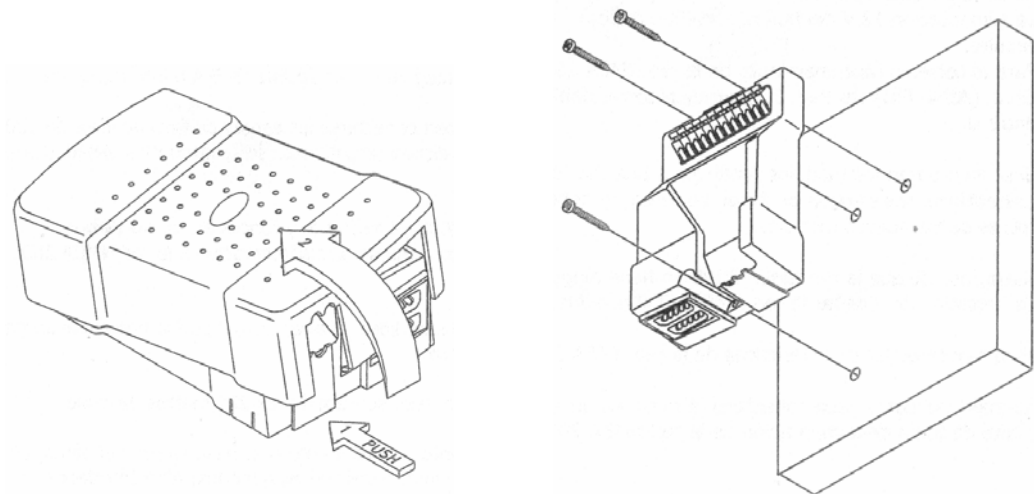


Figure 1. Module mounting.g

3.2.1 Module location if analogue gauges are already present

Alba-Engine has two types of connection:

- 1 – Motor sensors connection
- 2 – NMEA 2000 network connection

Thus, the Alba-Engine interface should be placed between the main NMEA 2000 network and the analogue gauges. This is because you'll have to connect some wires from the interface to the back of the gauges and others to the NMEA network.

Emmi network recommends putting the Alba- Engine at a maximum distance of 4 metres from the motor sensors. The Alba-Engine interface should be connected to the main network at a maximum distance of 6 metres, although the user should consider putting it as close to the main NMEA network as possible to save in cable costs.

Placing of the interface is not critical and taking into account the aforementioned distances and that all NMEA cables and connections are water-proof (IP67, protected against temporary immersions in water), the interface could be located virtually anywhere in the ship.

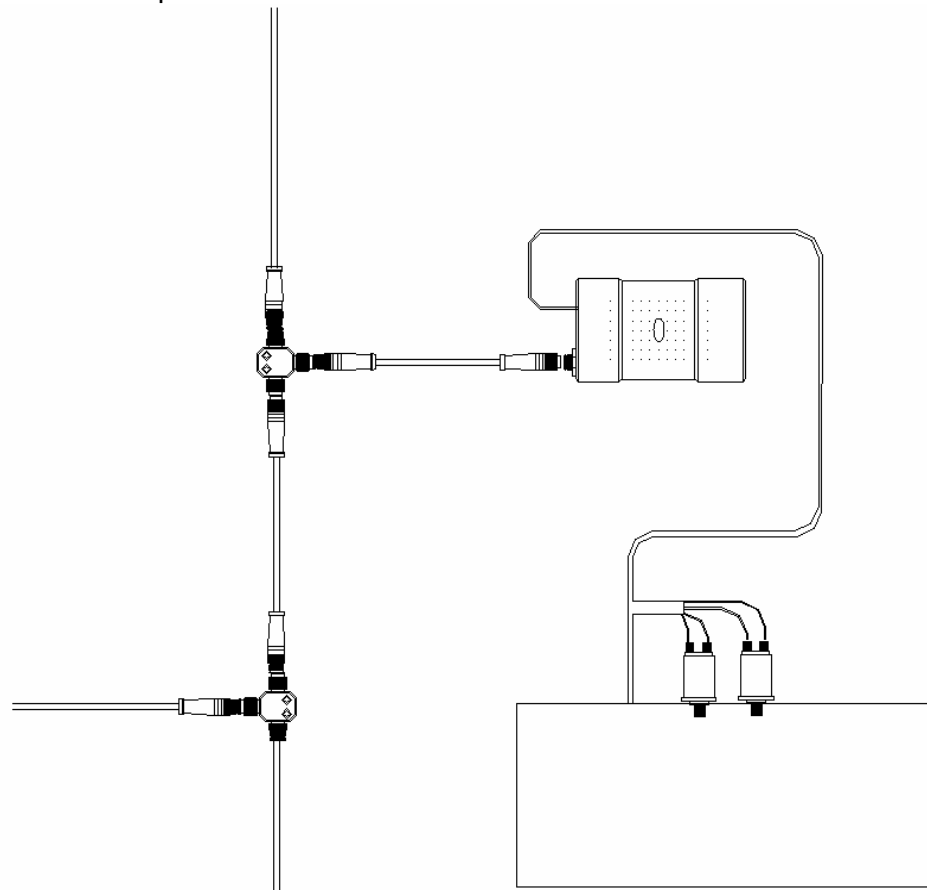


Figure 2. Wiring diagram from the module to the motor sensors

3.2.2 Module location when there are analogue gauges on the ship.

Alba-Engine has two kinds of connections:

- 1 – To the motor sensors
- 2 – To the NMEA 2000 network

Thus, it should be connected between the main NMEA-2000 network and the analogue gauges. This is because you'll have to connect some cables to the back of these gauges, and the interface to the NMEA network.

Emmi network recommends putting Alba-Engine at a maximum distance of 4 metres from the analogue gauges. It can also be connected to a maximum distance of 6 metres from the NMEA network, although the ship-owner may consider installing it closer to the main NMEA network in order to save on the cost of cable.

Interface install location is not critical, and taking into account that all NMEA cables and connector are watertight (IP 67: protection against temporary immersions in water), the interface could be placed virtually anywhere on the ship.

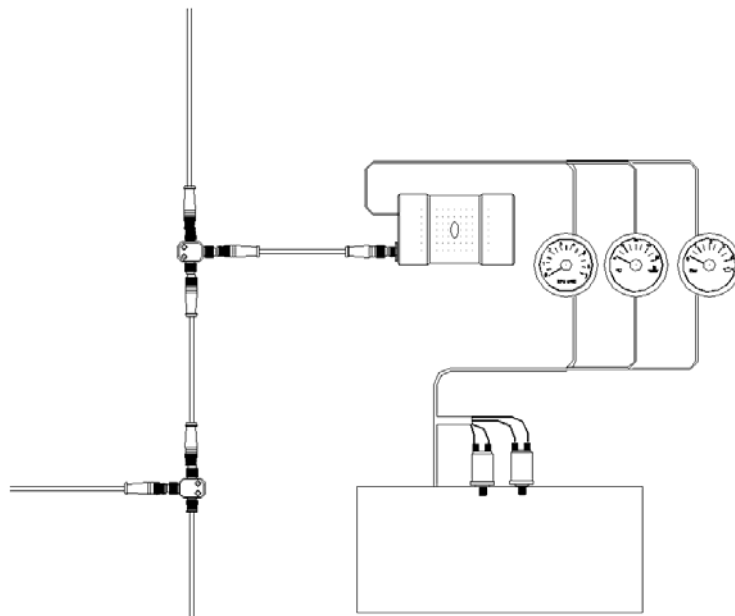


Figure 3. Connection diagram of the module in parallel with analogue gauges

3.3 Alba-Engine Connections

There are two (see figure) connection points for the Alba-Engine:

- 1 – Motor sensor connections
- 2 – NMEA 2000 network connection

You should also take into account that Alba-Engine requires an Alba-USB connected to a laptop computer to configure the sensors once all the connections are ready (see points 2.3.1 and 2.3.2)

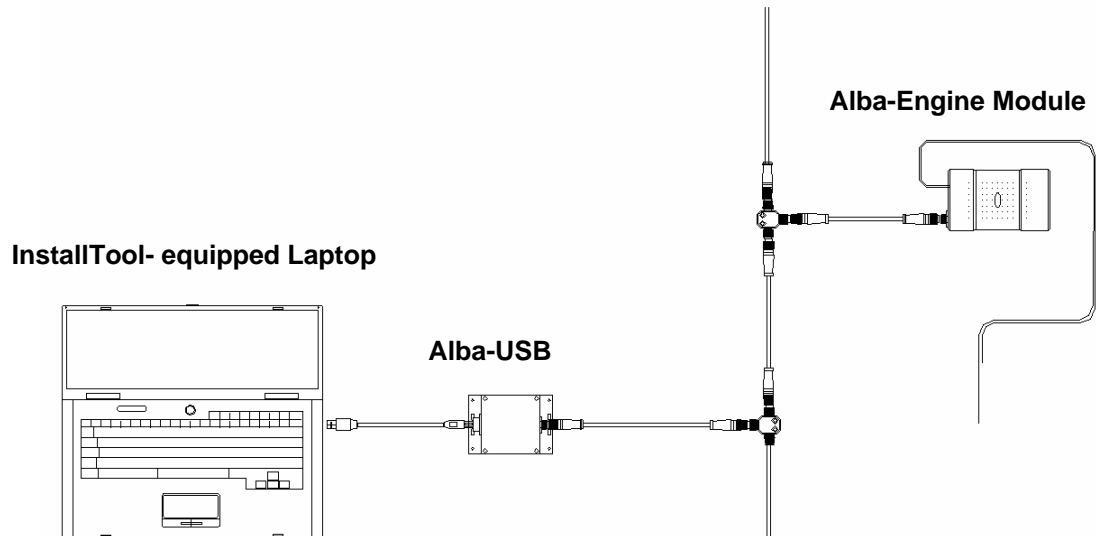
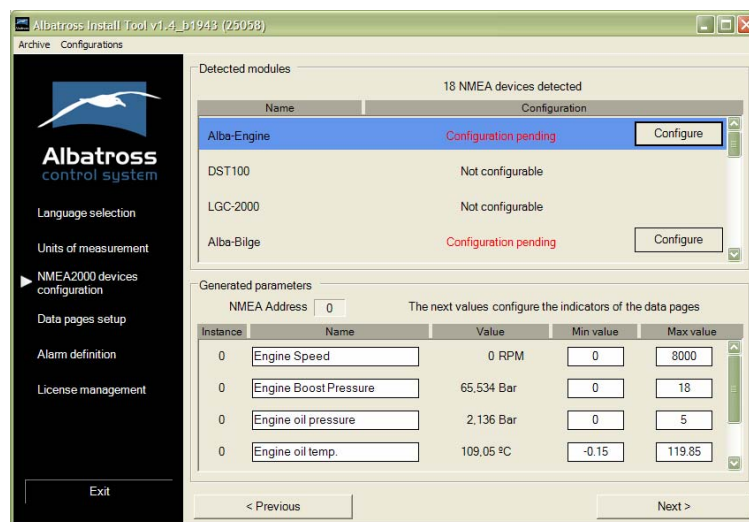


Figure 4 Wiring diagram to the Alba-USBB



3.3.1 Alba-Engine connection to a motor with VDO analogue gauges

Alba-Engine can work together with analogue motor gauges without affecting their measuring. To make this kind of connection you will have to follow the instructions given in the following illustrations

3.3.1.1 Connection to a Tachometer

For this type of connection you'll need to derive a wire from the (orange-coloured) one marked W in the gauge, connecting it to input number 2 in the Alba-Engine.

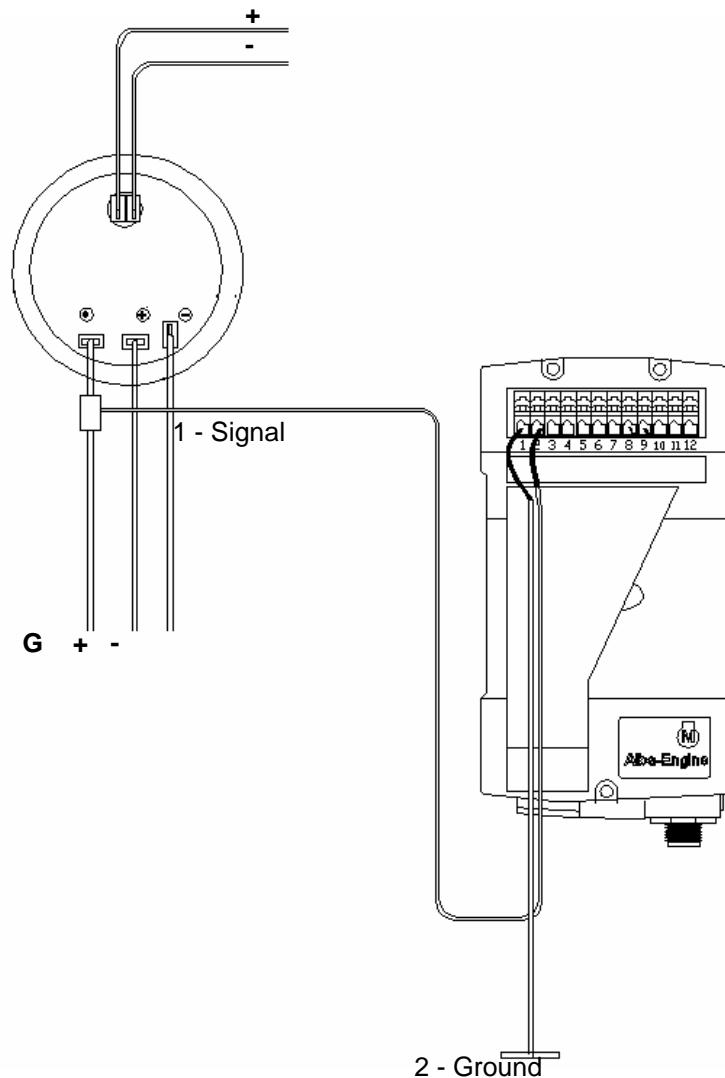


Figure 5. Wiring diagram of the module to a VDO tachometer.

3.3.1.2 Connection to a pressure or temperature gauge

You'll need to unscrew the connector's nut in these gauges and hook a new cable to be connected to either the 4, 6, 8 or 10 inputs in the Alba-Engine.

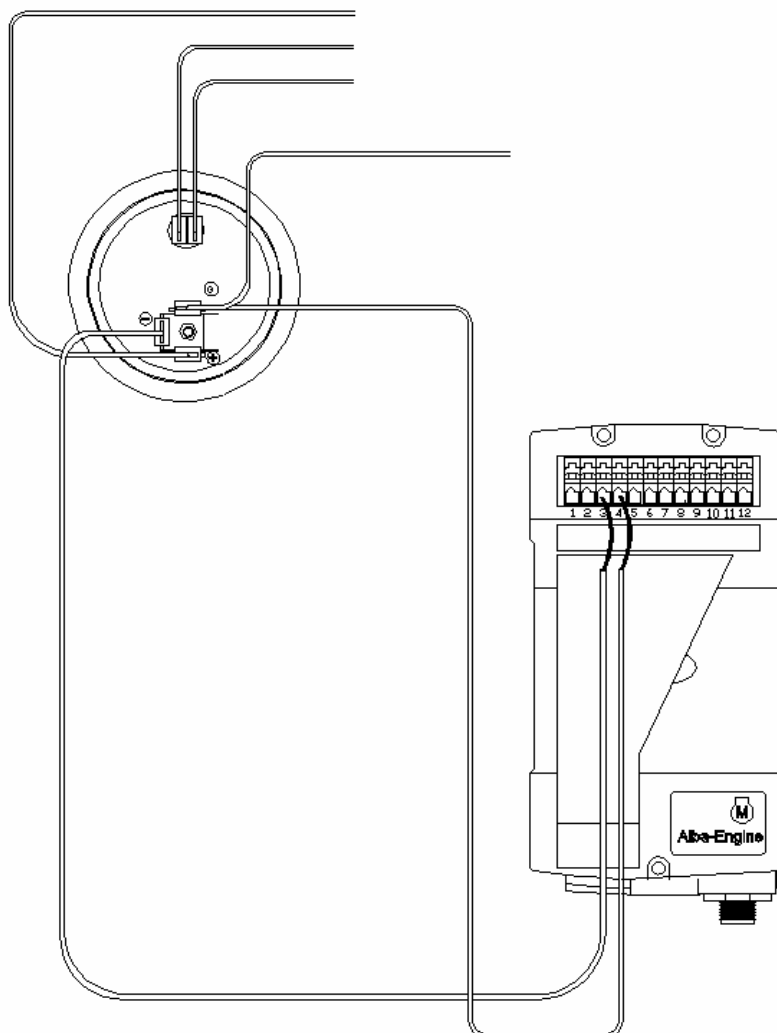


Figure 6. Wiring diagram of the module to a VDO pressure or temperature analogue gauge.

Gauge terminals	Proposed cable colour
Tension (+, +12V, I, IGN)	Red
Ground (-, \perp , G)	Black
Sensor (S, G)	Green

Table 1. Standard gauge connectors

3.3.2 Alternator and mass connection

To connect the alternator's input and measure the incoming voltage from it, you'll need to connect a cable to the +V connector in the voltmeter gauge. If your motor's control panel has no voltmeter, locate the alternator's connection to the battery bank.

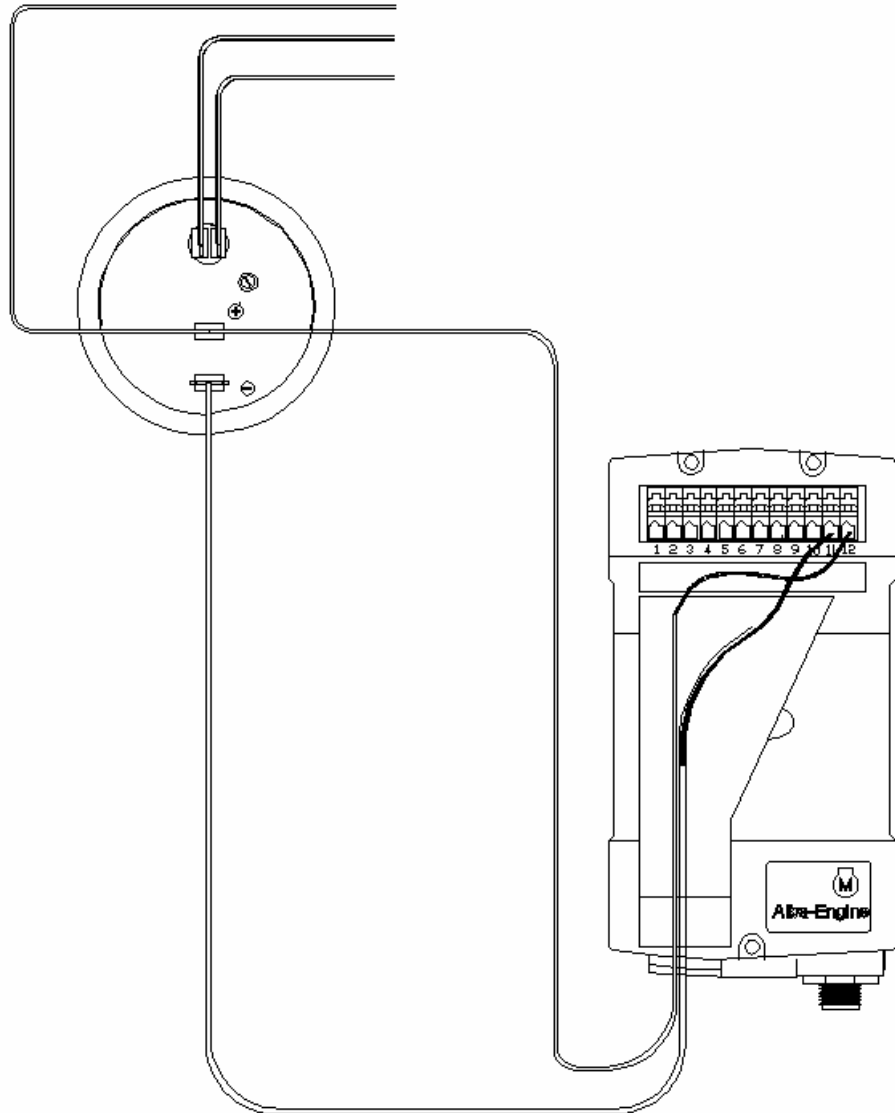


Figure 7. Wiring diagram from the module to a VDO voltmeter

3.3.3

Alba-Engine connection to a motor with no control panel

If you have a motor with no control panel, you'll need to connect Alba-Engine's inputs directly to the motor sensors following this diagram:

- 1- NEGATIVE
- 2- W SIGNAL/ SENSOR
- 3- NEGATIVE
- 4- RESISTIVE SENSOR
- 5- NEGATIVE
- 6- RESISTIVE SENSOR
- 7- NEGATIVE
- 8- RESISTIVE SENSOR
- 9- NEGATIVE
- 10- RESISTIVE SENSOR
- 11- NEGATIVE
- 12- ALTERNATOR VOLTAGE MEASURE

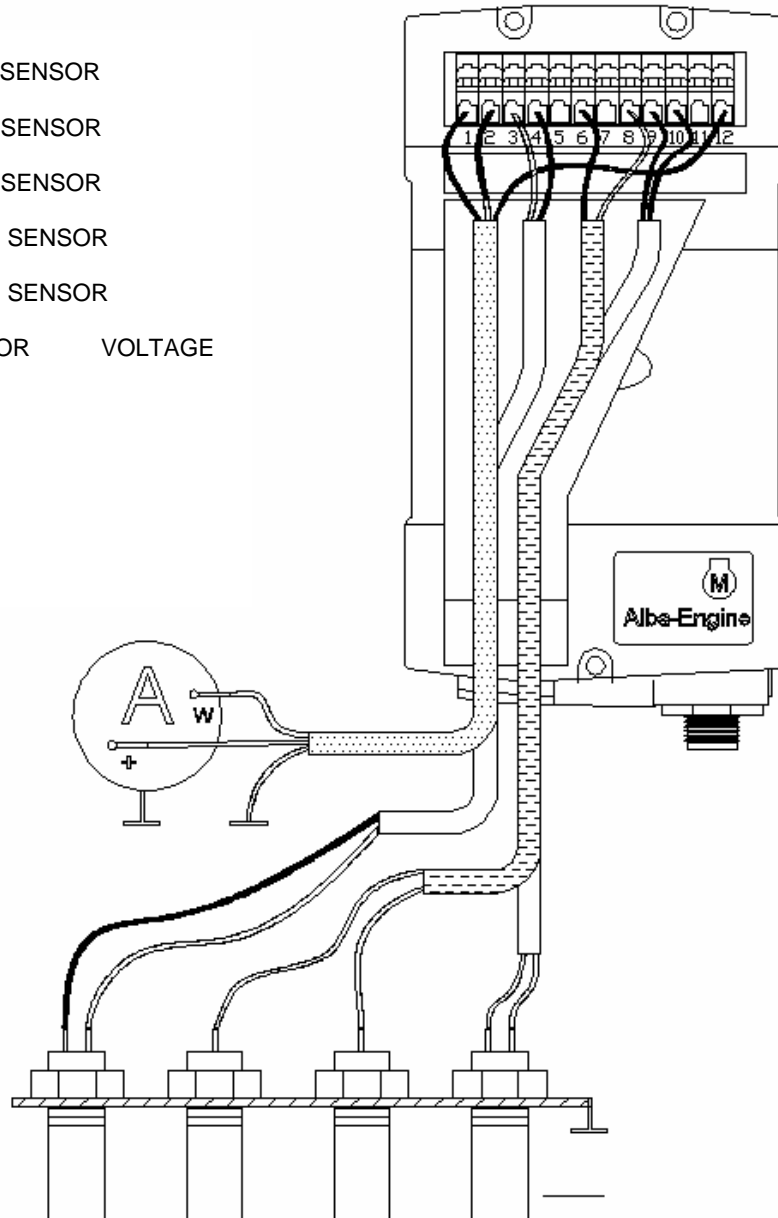


Figure 8. Connection Diagram of the module to resistive sensors

3.3.4 Connection to NMEA 2000 bus

The Alba-Engine interface can connect to a NMEA 2000 bus through a 5- pin Micro- C connector. You'll have to connect the Alba-Engine interface to the NMEA 2000 bus using a cable of the suitable length from the module to a T-connector to the main network.

Make sure the cable is firmly connected and the connector's collar is screwed tight.

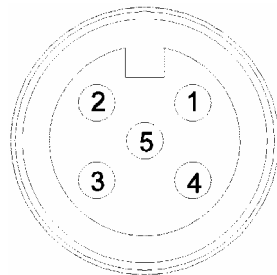


Illustration 1 Male connector

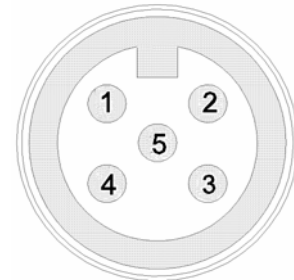


Illustration 2 Female connector

Figure 9. View of the NMEA 2000 Micro-C connectors

Pin 1:	Protective Braid
Pin 2:	NET-S. (Positive feed, +V)
Pin 3:	NET-C. (Common feed, -V)
Pin 4:	NET-H. (CAN-H)
Pin 5:	NET-L. (CAN-L)

Table 2. Micro-C Connectors

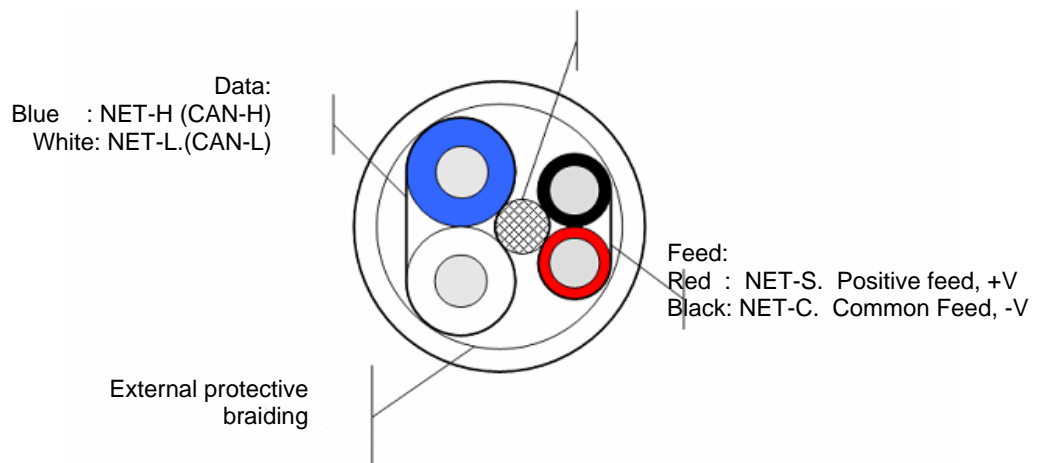


Figure 10. Inside view of a Micro-C cable

3.3.4.1 Raymarine equipment integration

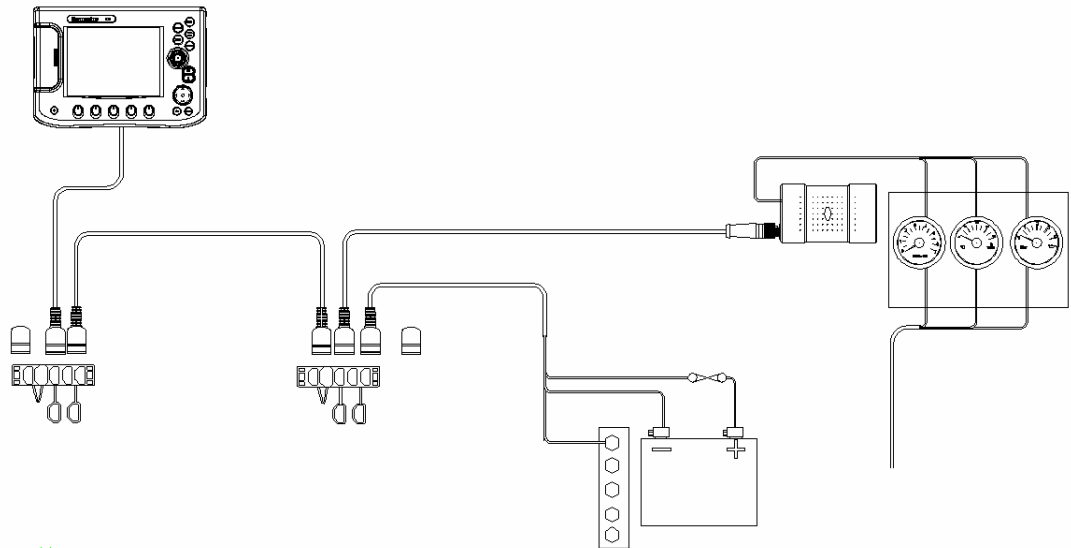


Figure 11.Connection diagram of the Alba-Engine to a Raymarine system

3.3.4.2 Lowrance equipment integration.

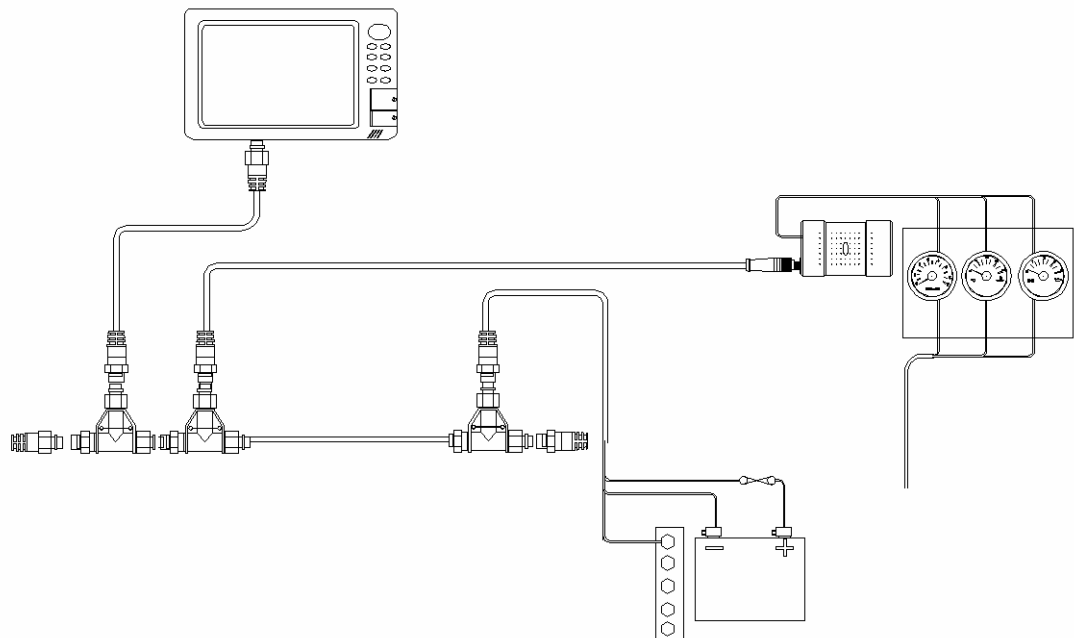


Figure 12.Connection diagram of the Alba-Engine to a Lowrance system

3.3.4.3 Simrad equipment integration

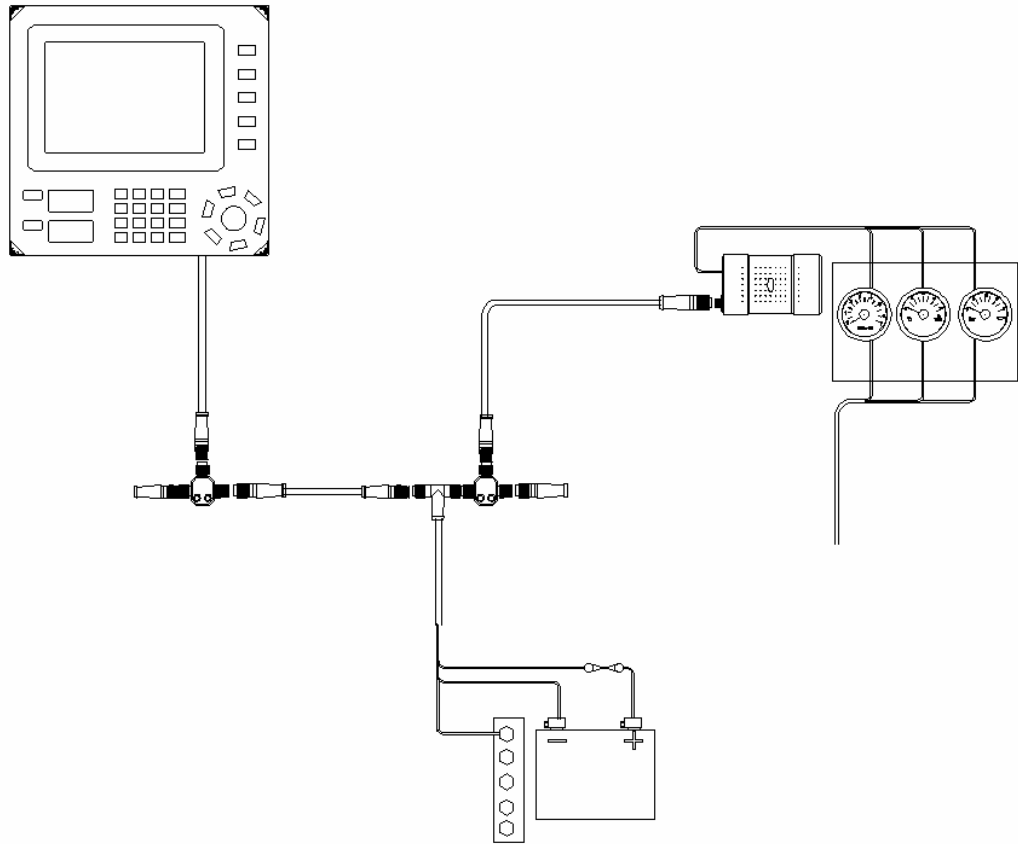


Figure 13. Connection diagram of the Alba-Engine to a Simrad system

3.3.4.4 Garmin equipment integration

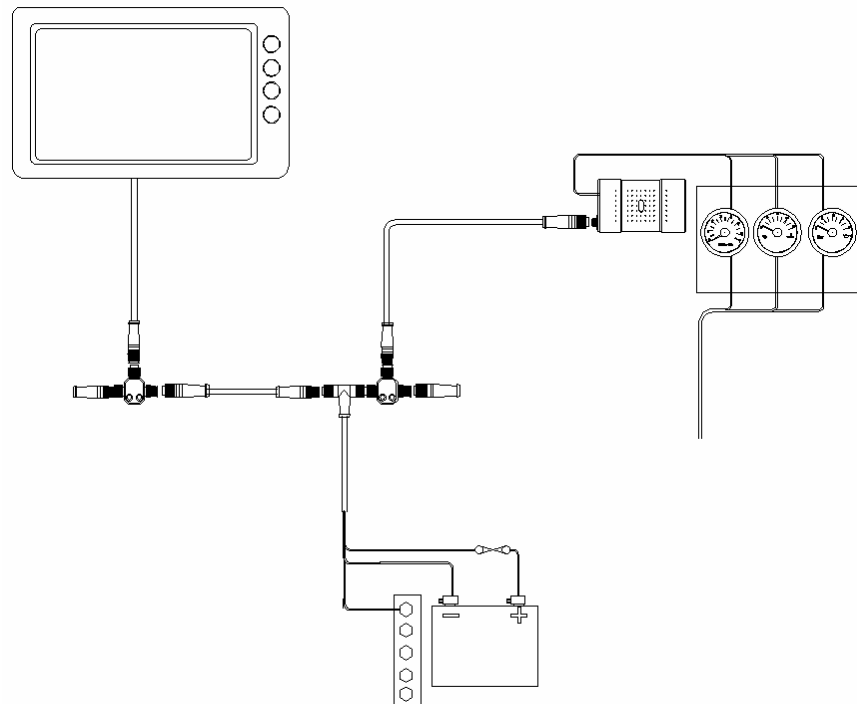


Figure 14. Connection diagram of the Alba-Engine to a Garmin system

3.3.4.5 Albatross system integration.

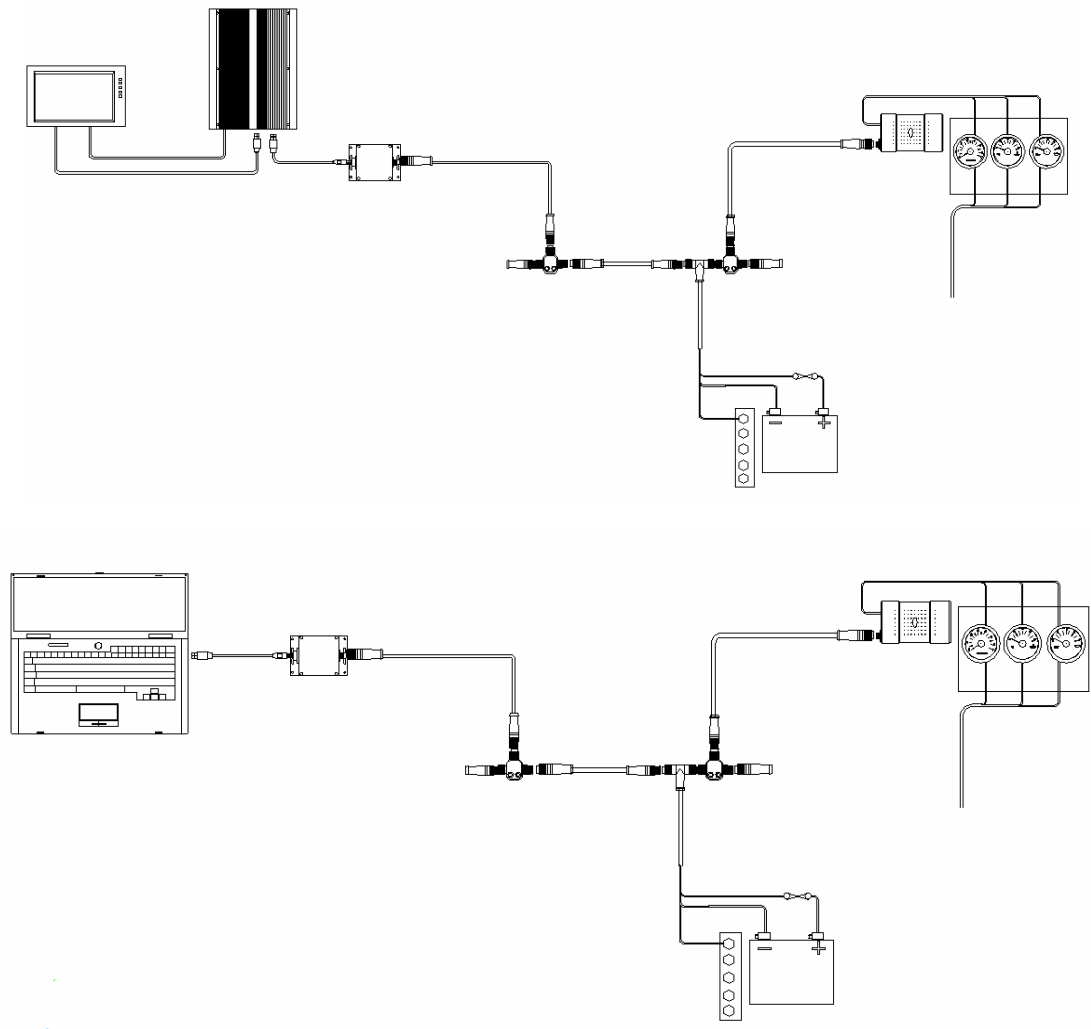


Figure 15. Connection diagram of the Alba-Engine to an Albatross System.

3.4

Alba-Engine Configuration

The following illustration shows the main configuration screen for the Alba-Engine interface.

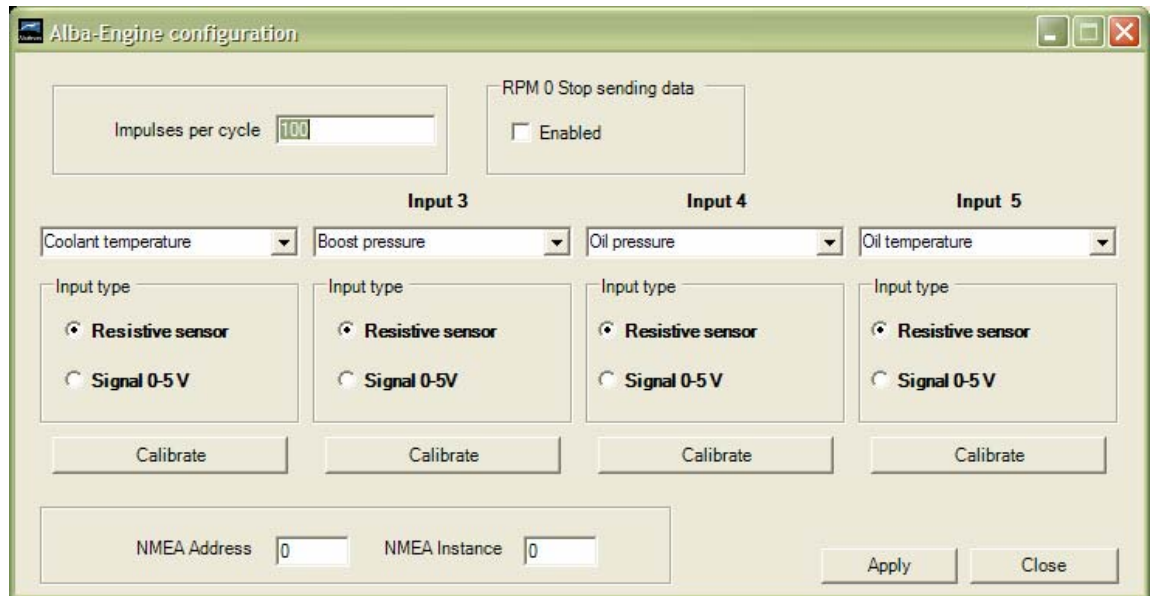


Figure 16. Main dialog box for the configuration of the Alba-Engine

To ensure the proper functioning of your ship, you need to configure each and every parameter in this dialog before using it. **DON'T USE** this product until you have gone through the whole configuration process, which is explained in detail in the following sections.

3.4.1 NMEA instance number and address

Most manufacturers use an instance number to reference the motor the interface inserts data about in the NMEA bus.

We recommend you to use the following table to assign the correct instance number.

Number of motors	Motor	Instance number
1	-	0
2	Port	0
	Starboard	1
3	Port	0
	Central	2
	Starboard	1

Table 3. Correspondence of instance number and motor location.

The device's **NMEA address** is automatically assigned, so it is not advisable to modify the value shown for it in the dialog box.

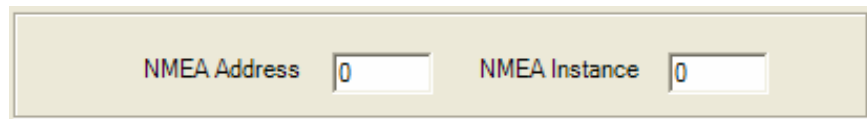


Figure 17. Detail of the NMEA instance number and address

3.4.1.1 Impulses per turn for RPM

Impulses per turn tell the Alba-Engine how many signals the alternator receives before the motor completes a revolution per minute. 100 impulses per turn is the norm, but this value may vary slightly, depending on the manufacturer of the alternator.

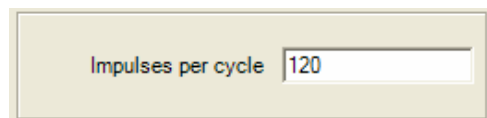


Figure 18. Detail of the impulses per turn for the calibration of RPM field

To calibrate this parameter having a tachometer installed, start the motor, note the tachometer and main configtool screen's readings, and change this value while checking the interface's values on configtool's initial screen to adjust the value accordingly.

Generated parameters

NMEA Address The next values configure the indicators of the data pages

Instance	Name	Value	Min value	Max value
0	Engine Speed	0 RPM	<input type="text" value="0"/>	<input type="text" value="8000"/>
0	Engine Boost Pressure	65,534 Bar	<input type="text" value="0"/>	<input type="text" value="18"/>
0	Engine oil pressure	2,134 Bar	<input type="text" value="0"/>	<input type="text" value="5"/>
0	Engine oil temp.	109,05 °C	<input type="text" value="-0.15"/>	<input type="text" value="119.85"/>

Figure 19. Screen showing the RPM information sent by the motor during the calibration process

3.4.1.2 Send 0 signal when RPM are 0?

You'll notice in some displays that when the motor is stopped while electric supply is still on, the dials in the digital gauges will go to the maximum value. If this is the case, click on the toggle box to avoid this behaviour.

RPM 0 Stop sending data

☐ Enabled

Figure 20. Detail of the behaviour when the motor stopped configuration field.

3.4.1.3 Choice of parameters to be measured

On inputs 2, 3, 4 and 5 the user can choose what parameters to represent on the digital display. The available parameters are:

- Boost pressure
- Oil pressure
- Coolant water pressure
- Oil temperature
- Coolant water temperature

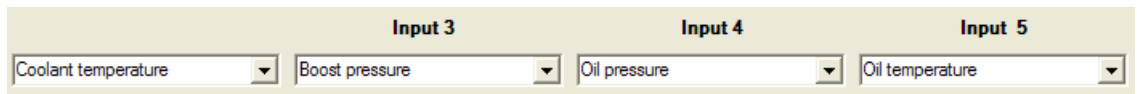


Figure 21. Detail of the configuration of parameters to be measured by the module.

Make sure the signal cable for each chosen parameter corresponds to the connector number from the following table:

Configtool input	Parameter	Alba-Engine connector number
Input 1	RPM	Connectors 1 and 2
Input 2	Pressure or Temperature	Connector 4
Input 3	Pressure or Temperature	Connector 6
Input 4	Pressure or Temperature	Connector 8
Input 5	Pressure or Temperature	Connector 10
Input 6	Alternator voltage	Connector 12

Table 4. Alba-engine inputs and connector number correspondence

3.4 Choice of sensor type

As seen in section 2, motor sensors are either resistive or voltage-based (VDO). You must choose the appropriate type of sensor connected for each parameter to be measured.

Once you have changed all the necessary fields in the dialog box, click “Accept” for all information to be programmed and stored in the Alba-Engine interface’s memory.

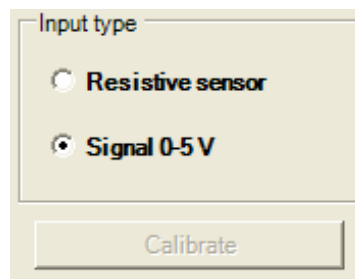


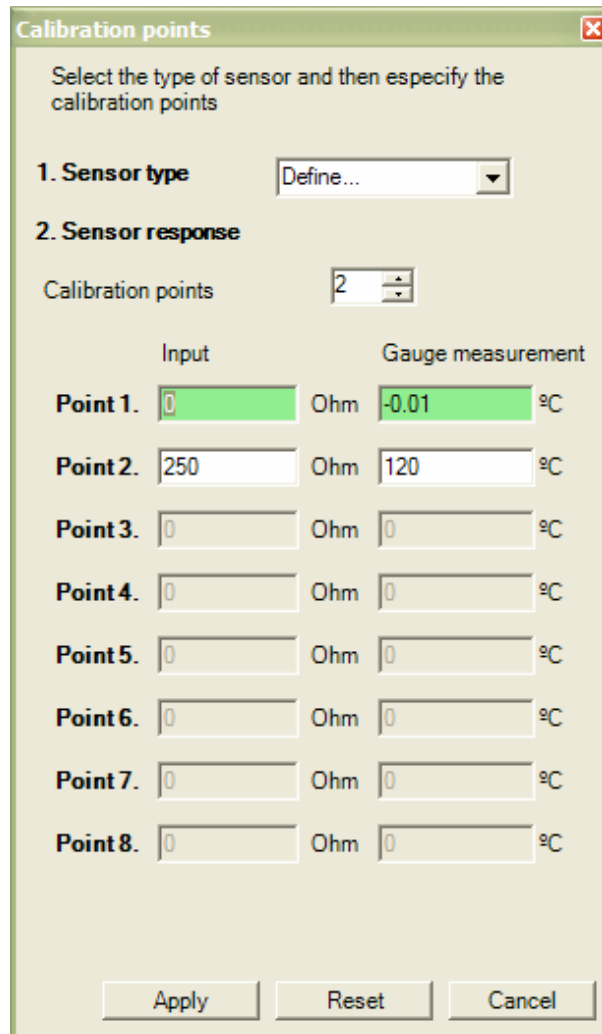
Figure 22. Detail of the sensor type (resistive or VDO) configuration field

3.4.2 Sensor calibration and commercial brand choice

Once sensor and measure units have been chosen, it's time to click on the “Calibrate” button for inputs 2 to 5. On pushing it, a new window will open where you can choose the sensor gauge’s brand and model to FOLLOW.

3.4.2.1 Sensor type

This is one of the most important steps in the configuration of your Alba-Engine unit, as each commercial gauge and sensor has its own specific configuration, and proper configuration of these is fundamental to ensure the accuracy of its measurements.



Calibration points

Select the type of sensor and then specify the calibration points

1. Sensor type: Define...

2. Sensor response

Calibration points: 2

	Input		Gauge measurement
Point 1.	0	Ohm	-0.01 °C
Point 2.	250	Ohm	120 °C
Point 3.	0	Ohm	0 °C
Point 4.	0	Ohm	0 °C
Point 5.	0	Ohm	0 °C
Point 6.	0	Ohm	0 °C
Point 7.	0	Ohm	0 °C
Point 8.	0	Ohm	0 °C

Buttons: Apply, Reset, Cancel

Figure 23. Dialog box for calibration points in a sensor.



3.4.2.2 Voltage correction enabled?

If you connected the Alba-Engine in parallel with VDO gauges, you'll have to note the tension at which the configuration is being set in this field (see the initial screen of Installtool, Figure 4) and check the toggle box marked "enabled". You'll also have to enter the voltage value at which the measurement was made (in figure 23, the example is 12,29 V)

Reference voltage

By checking this field, you'll tell Alba-Engine that the voltage your ship works on may change during its functioning, and this will allow you to adjust the gauges' readings for maximum accuracy at any time.

3.4.3 Custom sensor calibration

Sensors connected to the Alba- Engine module may need calibration for any of the following reasons:

- 1 – A resistive or non-standard tension sensor is being used
- 2 – A standard sensor is in use, but maximum accuracy is desired.

Annex 1 to this handbook shows you an in-depth explanation of this process.

3.5 Albatross system upgrades

The Albatross Control System allows you to easily incorporate new characteristics and functions by installing software upgrades and expanding their licenses.

Albatross Control System includes a digital onboard control system tool and remote ship safety, positioning and monitoring services.

Albatross adapts to the needs of ship-owners who care for onboard safety, and is flexible enough to adapt to ships of any kind and length.

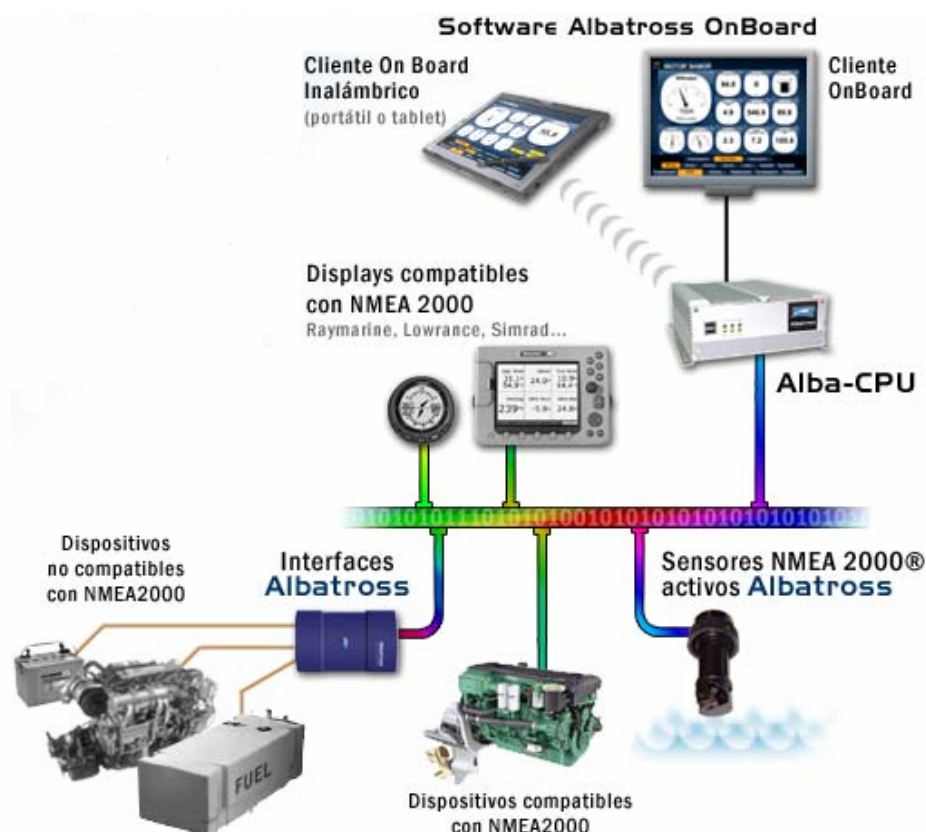


Figure 24. General diagram of possible upgrades to the Albatross system .

For further information, please visit: www.emminet.com

3.6 Maintenance

Once installed and configured, there are no specific maintenance measures to be taken.

Periodically examine all the components of your Albatross system, including sensors and wiring, looking for signs of wear or damage. Repair them if needed.

3.6.1 Troubleshooting

All Albatross products go through exhaustive functioning and quality tests. However, if any problem appears, the following table may help you identify the cause and find a solution for it.

Problem	Possible cause	Solution
Albatross modules show no sign of activity (red LED is off)	Supply or connection failure	Check electric supply connection Verify Check use or protecting circuit. Check all connections among the modules
Albatross modules seem to be blocked (red LED is always on)	Connection failure among modules or the NMEA bus ender is missing	Check all connections and the existence of at least one network ender.
Information shown on displays or visualization clients is incorrect	Module configuration is incorrect	Check module/s configuration
A certain type of data (e.g.: battery tension) is missing on the display or visualization clients	Sensor information is missing	Check sensor Check connections form the sensor to the Albatross module

Table 5. Common problems and their possible solution

3.7 Technical specifications

SPECIFICATIONS	
Input	Magnetic sensor / W signal
	4 x Resistive sensor (0 to 250 Ohm)
	DC tension: 32V DC max.
Accuracy	RPM: ± 100 rpm
	Resistive sensor: 1%
	DC tension: 1%
NMEA2000 Parameter Group Numbers (PGN's)	
Periodic	PGN127488 Eng.Pa. Rapid Update
	PGN127489 Eng. Param. Dynamic
Information	PGN 126464 Tx/Rx PGN List
	PGN 126996 Product Information
Control	PGN 059392 ISO Acknowledge
	PGN 059904 ISO Request
	PGN 060928 ISO Address Claim
	PGN 126208 NMEA Request Group
	PGN 126720 Proprietary fast-packet
ELECTRIC SPECIFICATIONS	
Tension	9-16V DC from the NMEA bus
Consumption	<140mA
Equivalent load	3 LEN depending on NMEA2000
MECHANICAL SPECIFICATIONS	
Size & Weight	143mm x 86mm x 38mm , 230g.
Weight	230g
Mounting	Surface, screwed on
Case material	Polycarbonate UL94V0
ENVIROMENTAL SPECIFICATIONS	
Water tightness	IP54
Working temperature	-15°C a +55°C
Storage temperature	-25°C a +85°C
Relative humidity	93% RH @ 40°C per IEC60945-8.3
Vibration	2-13.2Hz @ ± 1 mm 13.2-100Hz @ 7m/s ² IEC60945-8.7
Salt mist Corrosion	4x7days@40°C, 95%RH after two hours salt spray IEC60945-8.12
E.M.C.	Emission IEC60945-9
	Immunity IEC60945-10



3.8 Technical support

Emmi Network provides the user with complete technical support through its webpage and a customer support hotline. Please use any of these means to contact us if a problem should arise that you can't solve.

3.8.1 Web

Please visit the customer support area in our webpage:

www.emminet.com

3.8.2 Customer support hotline.

If you happen not to have Internet access, please call the following phone number:

+34 902 010 759

3.8.3 Help us help you

Whenever you require any technical assistance, please keep the following information at hand.

- Equipment type
- Serial numbers
- Installed software version